ABSTRACT

Devices, systems, and methods for suturing of body lumens allow the suturing of vascular puncture sites located at the distal end of a percutaneous tissue tract. An elongated articulated foot near a distal end of a shaft is inserted through the penetration and actuated so that the foot extends along the lumenal axis. The foot carries suturing attachment cuffs, and needles are advanced from the shaft through the vessel wall outside of the penetration and into engagement with the needle cuffs after the foot has been drawn proximally up against the endothelial surface of the blood vessel. The cross-section of the shaft within the tissue tract can be minimized by laterally deflecting the needles as they leave the shaft, while tapered depressions within the foot can guide the advancing needles into engagement with the cuffs. The cuffs lockingly engage the needles and can be withdrawn proximally along the needle paths and through the tissue tract so as to form a loop of suture across the puncture. The articulating foot may be realigned with the shaft and withdrawn proximally through the tissue tract without dilating the tissue tract. The suture may be provided with a bight between first and second ends, the bight including one or more loops prearranged to define a pre-tied knot when one or more ends of the suture passed therethrough. A suture cutting blade may be positioned on the device such that when the needle is withdrawn from the device, the suture can be drawn across the blade to sever the suture.